

amateur radio

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COVER STORY

Our front cover this month depicts the VFO section of a Solid State SSB Amateur Receiver designed by Messrs. Tobin and Clift of Fairchild. The receiver is the subject of an article which is currently being published in series form in "A.R."

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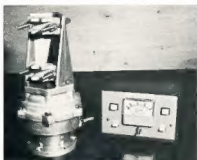
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FEDERAL COMMENT

Because we so often refer to our own Division as "The Institute" in order to draw a distinction between our Division and our Federal organisation, many of us sometimes refer to the Federal body as the "Federal Executive".

Recently I heard the President of a Division on a Sunday morning broadcast refer to the advantage that the "Federal Executive" would receive as a result of the transfer of the Institute's publication activities from a Victorian Divisional responsibility to a "Federal Executive" responsibility. Of course, he didn't really mean that the "Federal Executive" as such would receive any advantage at all. He meant that the Wireless Institute of Australia would receive an advantage, and this is merely another way of saying that all the Divisions would receive an advantage.

The Federal Executive is exactly what its name implies—it is "the Executive"—not some sort of club within a club. It is a group elected to carry out a defined task—in exactly the same way as at a Divisional level the Divisional Council is elected to carry out a defined task. A trivial point? We don't think so. It is a form of verbal shorthand that if used, often describes a fundamental truth. The Federal body is not the Executive, but all the Divisions banded together for their mutual benefit.

Another example of the same sort of "wrong labelling" that comes to my mind is that at times at Federal Con-

ventions a distinction has attempted to be drawn between "Executive" money and "Divisional" money. The only thing that is different is the source of the money; some coming from Executive activities such as the distribution of overseas publications (which one supposes is no more than a means of subsidizing the Divisions) and some of it coming from Divisional per capita payments. If that is what the label means, then it is accurate. If it is taken to mean that some money is "ours" and some is "yours", then it is a misleading label. All the money is the Divisions'—and therefore it is all "yours" as a member of a Division.

We of the Executive do not wish to be thought of as some sort of rather exclusive and remote "club". We do not want to be faceless men. If we are, then we are failing in our task. If our Federal affairs are remote and intangible, then members can hardly be blamed for questioning the worth of the expenditure of part of their subscriptions on the expenses associated with our Federal body. If all the advantages are said to accrue to a small group of people in Melbourne, then an attitude that is at least questioning, can surely be justified.

No—the "Executive" does not get the benefit—the "Institute" does. We do not talk of "the Council" when we mean a Division. Let us say "Institute" when we mean our Federal organisation, and "Division" when we mean a Division.

M. J. Owen, VK3KI,
Federal President, W.I.A.

too complex for me and, no doubt, the cost would go up.

A few items in the circuit need some comment. The resistor (Rx) and diode (Dy) found their way into the circuit when initial attempts to count at 100,000 KHz. were unsuccessful—I take it that they act as pulse conditioners. The resistors in the base leads of the lamp-driver bases are shown as 47K, but this value will require adjustment according to the characteristics of the individual transistor. A value of 47K was found suitable for those 083 transistors with a β of 100, a higher value of β will call for a higher value of resistor. Selection of transistors with the help of a transistor tester is thus a worthwhile procedure.

Some time is required to juggle with some of these resistors and their associated transistors to arrive at a condition where the required lamp lights up and its partner glows only faintly. But with careful adjustment there is no ambiguity in the count. When pro-

The two 15K resistors in the leads to the bases of the 083 transistors are minis and are mounted underneath the board.

The costing has been arrived at as follows:

| | |
|---|---------------|
| 14 transistors at 7.5c each | — \$1.05 |
| 34 resistors (20 x 10K, 5 x 47K, 5 x 1K, 2 x 3.3K, and 2 x 8.2K) at 4c each | 1.36 |
| 10 lamps | 2.95 |
| | \$5.36 |

Also to be bought are 1 x 680 pF. and 2 x 33 pF. capacitors and possibly two 300 ohm resistors and two mini 15K resistors, although these come on some boards. The diodes and the remaining capacitors and resistors come along with the transistors. Actually, the costing may be somewhat spurious; you buy the boards in selected batches of ten and you will end up with a lot of 680 ohm and other resistors and some

56 μ H. inductors and so on, as well as some 071, 034, 033 transistors, but these will, no doubt, find application in things like Schmitt trigger, gating and monostable circuits. An R-C bridge is useful for sorting out the capacitors which are colour-coded.

Then, too, you have to think about timing the duration of the count. There's a very handy device described by Weisburg (1968) in "Wireless World" which generates pulses at 100 KHz., 10 KHz., 1 KHz., 100 Hz. and 10 Hz. starting with a 100 KHz. crystal which I have found very useful.

Of course, you'll get caught in the long run. If you want to count megacycles you will have to pay more for the fast-counting stages, but you don't have to display these. This note was not written to present the ultimate in counters—it certainly is not that—but it was felt that the home-brewers and tinkers may be able to develop something which will be within the reach of most Amateurs. Thinking it over, I may be quite out of date—nowadays some Amateurs spend almost as much on their gear as I do on a new car.

Oh, what do you count? Do you remember when you discovered the grid dipper? You wondered how you had managed to get on without it. Apart from counting and frequency measurement, you can measure voltage, resistance, capacitance and so on. There are interesting things called unijunctions which come in handy. The counter becomes part of the equipment on the bench, even on the operating table.

Thanks are due to Dr. Bruce McMillan who provided the photographs.

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 Weisburg, K. V., 1968. Decade frequency standard. "Wireless World," 74, No. 1392, 185.

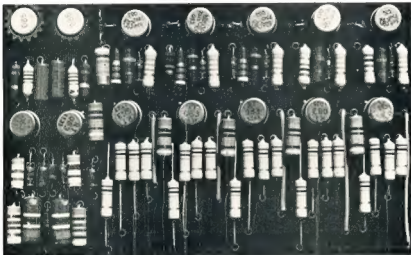


Fig. 2.—Decade Counter, 5 x 3 inches (photo 95 per cent. of size).

perly adjusted the read-out lamps are by no means lit to full brilliance. At a slow counting rate the partner of the lamp indicating at the time will be seen to glow faintly, the others do not.

The lamps are rated at 6 volts at 20 mA. Type T5GS printed circuit liliput telephone filament lamps (available from E. S. Rubin & Co. Pty. Ltd.), and are mounted in a row 0-9 on a separate board measuring 5" x 1", together with the two 300 ohm resistors (Fig. 3). The life expectancy of these lamps is longer than an Amateur should spend on his hobby. The odd-even switching transistors are Type 086 with cog-wheel heat-sinks which come with them on the computer boards. They run slightly warm to the touch but will get hot if the lamps are too bright. The leads between lamps and transistors are anchored to both boards. If you don't do this, you'll lose some transistor pins. Each decade complete with its lamps draws about 125 mA. at a regulated 12 volts.

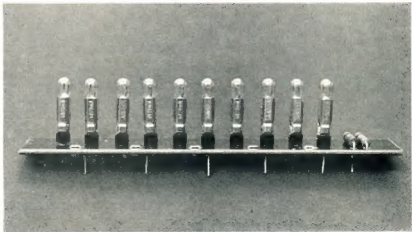


Fig. 3.—Lamps which indicate counts of 0-9 mounted on a separate board.

A SOLID STATE AMATEUR S.S.B. RECEIVER

PART THREE

B. G. CLIFT and A. E. TOBIN*

This article describes the design concepts, circuit operation and construction of the variable frequency oscillator covering the nominal range of 5 to 5.5 MHz. This provides the basic tuning function for the receiver on all bands of operation.

The fundamental problem with the design of any communications equipment covering a specified variable frequency range is that of frequency stability. Since the v.f.o. is the major contributing factor to the stability criteria of this receiver, the design of this section is extremely important and we must emphasize that care be taken in the construction and adherence to the circuit details which follow. Since single sideband reception is the major objective, it is desirable that the v.f.o. stability approach that of a crystal oscillator. This is only achieved by firstly taking all standard precautions and then carefully selecting suitable temperature compensating components.

In any linear oscillator where stability is important, two main design objectives must be realised. Firstly, we must isolate as much as possible the frequency determining components from the active device. This is enhanced by keeping the impedances around the transistor low compared to the dynamic impedance of the tank circuit. Secondly, we must provide a low impedance take off point so that loading the oscillator will have negligible effect on frequency. Often it is difficult to achieve both a low output impedance and a usable output level, so the use of an isolation or buffer amplifier is required.

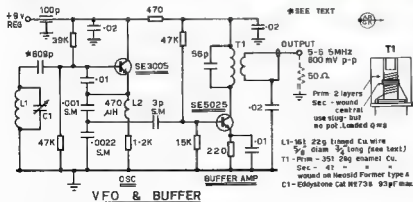
CIRCUIT DESCRIPTION

The circuit configuration used is that of a Colpitts Oscillator. This was chosen because it is relatively simple to provide low impedance terminations for the active device. Hence the effects of device impedance variations with temperature and supply voltage are kept to a minimum. The transistor used

in this position is an SE3005, which is a relatively new device to the Australian market and offers slight advantages over the SE3001 or SE3002. It has a higher f_r , a lower feedback capacitance and also guarantees a differential collector to base capacitance of 0.15 pF. maximum (at 1 MHz, V_{CE} 5 to 10v.).

However, either device may be used to achieve the same order of stability.

Temperature compensation is provided with the coupling capacitor between the tank circuit and the base of the SE3005. The actual value used here is about 600 pF. and is made up of 390 pF. silver mica, 39 pF. silver



mica, and 180 pF. N750 disc ceramic. The 0.01 μ F. between base and emitter is a Ducon mylar type DMA612. The other two capacitors in the oscillator with exception of rail by-pass and tuning capacitor are silver mica. The 0.0022 μ F. is the low impedance take off point for the buffer amplifier and can, in fact, be larger, provided the summed capacitance of the 0.001 and 0.0022 μ F. remains approximately constant.

The buffer amplifier stage uses an SE5025 and is very lightly coupled to the oscillator by a 3 pF. silver mica. It has a tuned collector which provides some reduction in harmonic content and allows a low impedance coupling to a terminated 50 ohm co-axial cable. The 50 ohm termination is important so

that the Q of the tuned circuit is reduced from 35 to approximately 8. The output level variation over the tuning range is approximately 10 per cent. and should be of no real concern.

It is important that the oscillator operate directly from the +9 volt regulated rail and not from a zener regulated supply. This is because the UA723 used in the power supply has a very good temperature stabilised reference—to use a zener would only result in the deterioration of the rail regulation because of temperature variations.

The v.f.o. is entirely housed in a $4\frac{1}{2}$ " x $3\frac{1}{2}$ " x 2" Eddystone die-cast box. All components are mounted directly onto the lid of the box to enable easy access to circuitry. A solderable ground plane was formed by simply placing a sheet of brass on the lid before mounting the components.

Angle brackets were made up for the gang so that it could be mounted with the shaft approximately central to the depth of the box. The brackets are isolated electrically from the frame of the gang by $\frac{1}{2}$ " tapped plastic stand-offs.

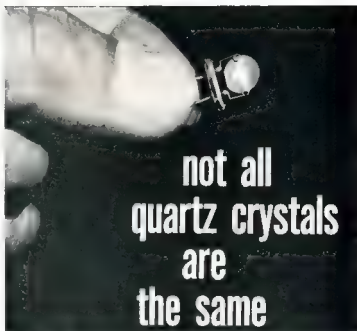
The coil was wound on a piece of grooved ceramic former from the normal radiator element. This was mounted on $\frac{1}{4}$ " standoffs via polystyrene plugs which were inserted into each end of the former. This method is fairly clumsy and an alternative method may be found. However, the method used does provide adequate mechanical rigidity which is the most important consideration. The coil should be mounted as closely as possible to the centre, but no less than $\frac{1}{8}$ " from the sides of the box, otherwise the Q will be seriously affected.

Other components of the circuit are mounted on a piece of matrix board which is again held via three stand-offs from the box lid. All ground connections are made via one braided earth strap from the gang centre shaft to one point on the lid ground plane. A brass earth strap is also used on the matrix board to provide effective earthing of circuit components (see photograph).

PERFORMANCE

- 1.—Supply: +9 volts regulated
- 2.—Frequency range: 4.970-5.530 MHz. (30 KHz. overlap)
- 3.—Output level: 800 mW. p.p. $\pm 5\%$ into 50 ohms.
- 4.—Temperature stability: -64 cycles with 20°C change in ambient (approx. 1 part in 10^5).
5. Warm up: negligible
- 6.—Output isolation: +80 cycles from 50 ohm termination to S/C (cable length 24").
- 7.—Supply rejection: 22.4 cycles per 100 mV. change in rail voltage.

Note.—The mixers and crystal oscillators will now be discussed in Part 4. These were previously promised for Part 3.



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are
the same

Today's sophisticated communications equipment calls for crystals that meet the most exacting standards of the art.

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| WA: | Associated Electronic Services Pty Ltd., Morley Phone 76 3858 | QLD: | Douglas Electronics Pty Ltd 322 O'd Cleveland Rd., Coorparua Phone 97 8222 |

110001

THE WORLD WITH A TRIANGLE

PART THREE

WAL SALMON,* VK2SA

[Part One appeared in "Amateur Radio, October, 1968; Part Two, April, 1969—Ed.]

How many have tried to get directivity and gain from an antenna on 40 metres? If we decide to use a simple dipole the answer is orientation to get whatever we can in the desired direction. If we prefer a vertical, all that is left to do is to concentrate on lowering the radiation angle which is no mean feat in the majority of cases.

In the latter part of 1968 the author took a look at the facilities available for the construction of a two element directional antenna for 40 metres. If you are interested in the installation of a high tower and the purchase of a commercial 40 metre beam, don't read any more of this article.



The Author, VK2SA.

The reader might now refer to the triangular configuration Fig. 1 of April 1969 "Amateur Radio" (page 10). It will be seen that there is space available between the two 20 metre quads for the installation of an additional antenna. Thought was then given to the construction of a two element fixed array for 40 metres and it was decided to experiment with two driven loops with a phasing section to permit reversal of direction. Two loops were constructed, the top and bottom sections being 35 feet, and the vertical sections 30 feet, and when hoisted in the air the average distance apart of the horizontal top sections was approximately one-quarter wave. The bottom sections of the loops are brought closer together than one-quarter wave for convenience in feeding the array and are 12 feet from ground.

Consideration was then given to the method of feeding the loops and it was decided to use the same system as adopted for the 20 metre quads, namely, tapped loading coils and 300 ohm open tv line. Two coils of 23 turns wound on 1½" plastic tubing and tapped at 10 turns were constructed and inserted in

the southern corner of each loop. A g.d.o. check indicated a resonance of approximately 7.5 MHz. In each loop. Small tuning condensers were then mounted in metal waterproof boxes and mounted on wooden supports below the loading coils in each loop and both loops were then tuned to 7 MHz.

A phasing delay stub consisting of 34 feet of open wire 300 ohm t.v. line was then constructed by winding the t.v. line over a flat masonite board 2 feet by 15 inches. The stub was then mounted on the wall of a fibrolite shed

(continued on page 15)

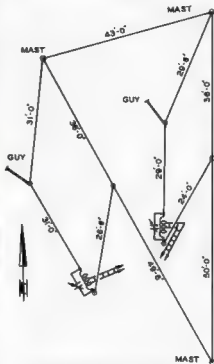
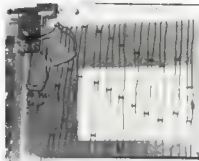


Fig. 1.—VK2SA's 40 Metre Loops.



Loop delay stub 34 feet



Loop tuning box and coil, 12 ft. from ground

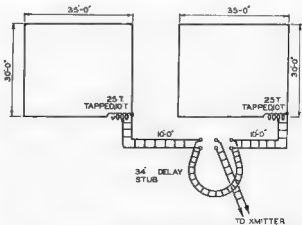


Fig. 2.—VK2SA's 40 Metre Driven Loops.

Note—Drawing shows incorrect number of turns on coils. Coils should be made of 23 turns, tapped at 10 turns.

* 77 Flora Street, Kirrawee, N.S.W. 2232.

VISIT TO POINT HICKS

Thirteen members of the Victorian Division made the 310-mile trip from Melbourne to place the first part of the Australian coast sighted by Captain Cook on the Amateur bands as a part of the Captain Cook Bicentenary celebrations.

All bands from 1.8 MHz. to 432 MHz. were operative at some time over the 18th to 20th April, something approach-

the same city, so that our host was able to talk back there. He showed plenty of interest in that QSO as well as other contacts.

Those who made the trip enjoyed the formal ceremony, and the start of the yacht race to Botany Bay, and would like to thank all those who gave us contacts as this was what the expedition was about. We were pleased to

obtain a couple of contacts from Whitty, in Yorkshire, as this was the home port of the collier which was to become famous as H.M. Bark Endeavour.

QSL and certificates will be forwarded to all stations who contacted AX-3AWI/Portable at Point Hicks.

We certainly hope we will have the opportunity to work you all again from our home QTHs.



ing 1,000 QSOs resulted. As one would expect, almost all of these were on the h.f. bands. Ideal conditions existed for both radio and weather.

Good results were obtained from all h.f. equipment. 1.8 MHz. and 14 MHz. were located on a site in view of the lighthouse, and the pressure on 14 MHz. was so great at times that the operators had to leave off for a while to let the QRM settle.

Although only six watts r.f. was available for 1.8 MHz., AX2, AX3 and AX5 stations were worked.

3.5 and 7 MHz. sites was on the eastern side of the Cape and splendid results were obtained at all times. The 40 metre call-back after the broadcast was taken from here and went for over an hour.

It was attractive enough for a local in the form of a snake to pay us a visit at this stage and the tent was quickly vacated by personnel, but despite a thorough search he managed to get away.

Despite the inverted vee antenna, a G was worked on sideband on this band as well as other DX on 7 MHz.

21/28 MHz.: A beam was used on 21 MHz. and a whip for 28 MHz., and again good results. The site was actually on the beach on the eastern side.

V.h.f. was at the 14 MHz. site, but only limited results were obtained, mainly with the Swinburne College Radio Club who were active from National Parks in the area.

We were made welcome by the lighthouse keeper who hailed from Belfast and we were able to raise a GI from

SOLID STATE EXPENSIVE?

COMMELEC INDUSTRIES breaks the price barrier with a range of high performance low-cost kits

I.C. F.M. I.F. AMPLIFIER and DEMODULATOR KIT—see "A.R." June 1970. Frequency: 455 KHz. (nom.); Sensitivity: 12 μ V for 10 dB S/N (dev. 5 KHz., f. mod. 1 KHz.); 40 μ V. for hard limiting. Recovered Audio: 100 mV. average for hard limiting; Supply Voltage: 8V. to 15V d.c., positive or negative earth; Bandwidth: 16 KHz. with optional ceramic filter or determined by external filters; Dimensions: 4 cm. x 8 cm. fibre glass P.C. board. Complete kit less filter: \$9.80; Wired and tested: \$12.80. Ceramic Filter CFP455E. \$15.00.

I.C. ONE-WATT AUDIO AMPLIFIER KIT—see "A.R." July 1970. Power output: 1W R.M.S. into 8 ohms; Sensitivity: Adjustable from 14 mV. to 200 mV. R.M.S. for full output. Frequency Response: 160 Hz.-4.5 KHz. or 180 Hz.-13 KHz.; Design Supply Voltage: 12V. D.C. (positive or negative earth); Operating Voltage Range: 6-13.5V. D.C.; Input Impedance: 8-35K ohm; Dimensions: 4 cm x 8 cm fibre glass P.C. board. Complete kit (less speaker) \$8.40; Wired and tested: \$11.40.

144 MHz. to 432 MHz. VARACTOR TRIPLER KIT—Input: up to 40W at 144 MHz. Output: up to 30W. at 432 MHz., depending on diode used; Size: rectangular box 11 x 7.5 x 3.2 cm. when assembled. Complete kit including metalwork bent and cut to size and ready for soldering, excluding diode: \$5.80. 2N3632 transistor (unbranded) will give 13.5 W. output when used as an amplifier on 144 MHz. or 10W. output at 33% efficiency when used as a varactor tripler from 144 MHz. to 432 MHz.: \$7.00.

All prices include sales tax and postage

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An Integrated Circuit F.M. I.F. Strip

J. REYNOLDS,* VK3ZMU

The f.m. i.f. strip described was designed as an add-on unit to enable reception of frequency modulated signals on existing receivers without this facility as standard

THE last few years have seen a remarkable growth in the popularity of f.m. on the v.h.f. and j.h.f. bands. While this is largely due to the ready availability of commercial transceivers suitable for Amateur conversion, a realisation of the technical and practical advantages has also contributed.

While f.m. can be better than a.m. or s.s.b. above a certain threshold input signal-to-noise ratio, it is doubtful if this is a real advantage for Amateur purposes since we are generally more concerned with receiving weak signals than achieving a very high recovered signal-to-noise ratio. Potential for noise

Amplitude modulated systems such as s.s.b. and double sideband a.m. impose stringent requirements on system linearity. Complex gain control circuits are necessary to prevent overmodulation or intermodulation splatter due to the wide range of signal strengths encountered.

These requirements do not exist for a frequency modulation system. Indeed best performance is achieved if the signals are hard limited, resulting in constant amplitude signals from the limiters. Interference is less troublesome since the stronger signal prevails for a difference in signal strengths of greater than about 3 dB.



AUSTRALIS-OSCAR 6 SATELLITE

One of the best reasons for being able to receive f.m. is the future launch of Australis-Oscar 8. This is expected to be a hard limiting multi-channel f.m. repeater system. If all goes as planned the satellite will allow international Amateur communication on the v.h.f.-u.h.f. bands.

THE CIRCUIT

The circuit diagram (Fig. 1) shows a source follower (MPF102) followed by a high gain i.f. amplifier and f.m. discriminator. The high gain amplifier and discriminator are contained in the one integrated circuit, an AWM1306.

Signal input, taken from a suitable point after the mixer, is coupled to the gate of the source follower via a 0.02 μ F. ceramic capacitor. The high value gate resistor (470K ohm) ensures that the f.m. i.f. strip does not disturb the normal operation of the receiver by detuning or damping tuned circuits.

The source resistor of the source follower stage is such as to give an output impedance of about 1.5K ohm, a suitable value for matching into the following filter or integrated circuit (see later)

The circuit of the IC is given in Fig. 2. The AWM1806, made in Australia by A.W.A., is by far the best amplifier-discriminator available today. Reference to Fig. 2 shows that the

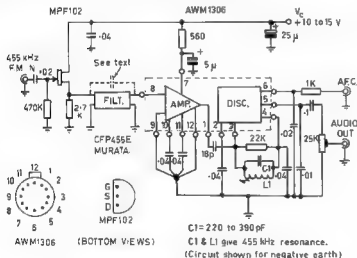


FIG. 1—F.M.I.F.-AMPLIFIER & DEMODULATOR CIRCUIT.

and interference improvement is a definite advantage but the practical advantages are probably more important. These include being able to run transistors and valves at their maximum ratings and being able to multiply to harmonically related bands without distortion. Only simple modulators are required, reducing the cost of equipment.

FM is by far the most suitable mode for use with active repeaters and translators. Repeaters demodulate the received signal to baseband and remodulate the transmitter with this demodulated signal. Translators use a heterodyne or multiplier system to change frequency between input and output.

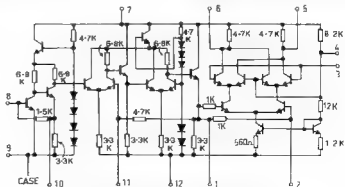


FIG.2 - SCHEMATIC OF AWM1306

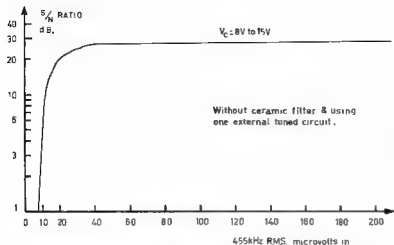


FIG. 3-FM, F-AMPLIFIER & DEMODULATOR CHARACTERISTICS (SIGNAL)

AWM1306 consists of a cascade of two common emitter stages followed by a differential amplifier, emitter follower, differential amplifier and second emitter follower. I.f. output is taken via lead 1 from the emitter follower stage to lead 3, the input of the discriminator section. Push-pull audio output is taken from pins 5 and 6 or single ended output from either. L1/C1 is a normal i.f.t. resonant at the i.f. frequency. The 22K ohm resistor across L1/C1 broadens the frequency response of the discriminator.

Audio output of approximately 100 mW. r.m.s. is coupled via a 0.1 μ F. capacitor to the 25K ohm potentiometer. If required, this pot. may be used to set the level of output of the f.m. demodulator so that it is equal to that from other detectors in the receiver.

FILTERS

Provision has been made on the circuit board for a Murata ceramic

block filter, type CFF455E. These filters provide a 6 dB. bandwidth of 16 KHz. and a shape factor of 2 (8/50 dB.). An i.f. bandwidth of 16 KHz. is adequate for most f.m. transmissions.

If it is desired to use the existing filter circuitry of a receiver the ceramic filter may be replaced by a 0.02 μ F. capacitor. Fig. 5 shows the possible connecting points in a typical receiver. Point A should be used with the ceramic filter or when maximum bandwidth is required. Points B, C and D can be used depending on the degree of selectivity required.

The bandwidth of a narrow band f.m. signal is equal to that of an a.m. signal, so that existing filters in an a.m. receiver are suitable. However for wideband f.m. it will be

difficult to achieve the necessary compromise between bandwidth and interference rejection. It is for this application that the ceramic block filter was developed.

When used with valve receivers it is essential that any coupling to a valve anode be via a 33K ohm resistor. This is necessary to prevent capacitor charging current destroying the field effect transistor. If the 0.02 μ F. 50V coupling capacitor specified in Fig 1 is used an additional capacitor of no more than 0.002 μ F. and of adequate voltage rating must be used in series. This is to reduce the d.c. voltage across the 0.02 μ F. capacitor to below its voltage rating.

CONSTRUCTION

The i.f. strip is constructed on a 4 cm. x 8 cm. fibre glass printed circuit board containing the whole of circuit 1 including filter. Connections to the board are made via small pins. Provision has been made for either positive or negative earth as determined by two straps. D.c. output may be taken from pin 6 for automatic frequency control or reception of f.s.k. signals.

PERFORMANCE

Fig. 3 shows the variation of output signal-to-noise ratio with input voltage at the gate of the FET. Fig 4 shows the variation of audio output with input voltage for various supply voltages.

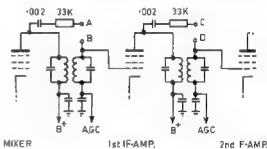


FIG. 5-TYPICAL CONNECTION POINTS

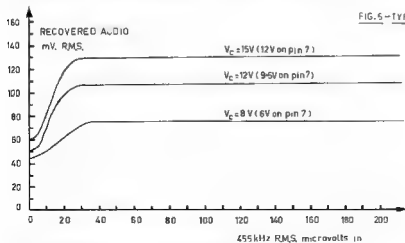


FIG. 4-FM, F-AMPLIFIER & DEMODULATOR CHARACTERISTICS (AUDIO)

Typical performance figures are:

Nominal operating voltage, 12v.

Sensitivity ($f = 455$ KHz., dev. = 5 KHz., $f_m = 1$ KHz.): 12 μ V. for 10 dB. S/N.

Full limiting: 40 μ V.

Audio output at full limiting, 105 mV.

Audio distortion

(400 μ V. input) 3%.

(10 mV. input) 2.5%.

Operating voltage range, 8-15v.

Useful frequency range: up to 2 MHz.

ALIGNMENT

Adjust L1 for best audio quality or for zero volts d.c. between leads 5 and 6 with a strong signal at the desired frequency applied. Set the output level potentiometer as required.

On the Concentration of Ferric Chloride

Information for Etching Printed Circuit Boards

MORTON P. DAVIS,* VK3AG

The following information is presented for the benefit of the increasing number of Amateurs who are etching their own printed circuit boards using ferric chloride.

A table is given, showing the basic data, and examples of the necessary calculations are provided.

| 1 | 2 | 3 | 4 |
|--------------|--------------|--------|-------------|
| A% by weight | H% by weight | S.G. | W gm./litre |
| 20.00 | 33.33 | 1.1838 | 82.9 |
| 22.00 | 36.86 | 1.2043 | 80.5 |
| 24.00 | 39.99 | 1.2254 | 78.5 |
| 26.00 | 43.32 | 1.2473 | 76.9 |
| 28.00 | 46.66 | 1.2699 | 75.5 |
| 30.00 | 49.99 | 1.2934 | 74.5 |
| 32.00 | 53.32 | 1.3176 | 73.8 |
| 34.00 | 56.66 | 1.3426 | 73.7 |
| 36.00 | 59.99 | 1.3681 | 73.2 |
| 38.00 | 63.32 | 1.3941 | 73.4 |
| 40.00 | 66.66 | 1.4200 | 74.7 |

A% = Anhydrous compound weight e.g. grams solute per 100 grams of solution.

H% = hydrated compound weight per cent.

S.G. = specific gravity of solution at 20°C.

W = water displaced by anhydrous solute, grams/litre

1 lb. = 453.6 gm.

1 litre = 1.76 pints.

Example of Calculations for Hydrated Ferric Chloride (Fe Cl . 6H₂O).

Required S.G. = 1.38

By linear interpolation in columns 2 and 3, an S.G. of 1.38 requires a value of H% = 61.51%.

The weight of 1 litre of solution of S.G. = 1.38 is 1380 gm.

61.51% of 1380 gm. = 850 gm

Therefore, take 850 gm. of hydrated ferric chloride and make up to 1 litre,

or 500 gm. made up to 588 ml.

or 500 gm. made up to 1.03 pints.

Example of Calculations for Anhydrous Ferric Chloride (Fe Cl)

Required S.G. = 1.38.

(a) By linear interpolation in columns 1 and 3, an S.G. of 1.38 requires a value of A% = 36.92%

The weight of 1 litre of solution of S.G. = 1.38 is 1380 gm.

36.92% of 1380 gm. = 509 gm.

Therefore, take 509 gm. of anhydrous ferric chloride and make up to 1 litre,

or 500 gm. made up to 982 ml.

(b) By using the values of W in column 4 we can now calculate how much water must be added to any weight of solute to produce the required specific gravity.

By linear interpolation in columns 1, 3 and 4, an S.G. of 1.38 requires a value of A% = 36.92%, as above, which leads to a value for W = 129.4 gm./litre.

Therefore, to produce 1 litre of solution of S.G. = 1.38, take 509 gm. of anhydrous ferric chloride and add 870.6 ml. of water, or to 500 gm. add 855 ml. of water. This is approximately 1 lb. of anhydrous ferric chloride added to 1½ pints of water.

The range of specific gravity of solution suitable for efficient etching is 1.32 to 1.40, with an optimum value of 1.38, and if heated, the temperature should not exceed 130°F.

I acknowledge the assistance given by Mr. W. Mare, of the Cancer Institute, Melbourne.

★

ELNA CAPACITORS

Reduced prices have been announced covering a wide range of Elna electrolytic capacitors. Distributed in Australia solely by Soanar Electronics Pty. Ltd., the Elna range includes "Green-cap" and "Ceramic" capacitors, brochures for which are available on request from Soanar head office, 30-32 Lexton Rd., Box Hill, Vic., 3128.

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R." in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.

Please address all articles to:

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P.O. BOX 36,
EAST MELBOURNE,
VICTORIA, 3002

WORLD WITH A TRIANGLE

(continued from page 11)

midway between the two loop coils. A double throw double pole switch was installed in the shed and two ten foot 300 ohm feed lines installed to connect the loop coils to the phasing stub. Sixty feet of 300 ohm open wire line from the centre contacts of the d.p.d.t. switch to the shack transmitter completed the installation.

A point which I emphasize is the method of tuning the two loops which must not be checked by the g.d.o. with any feed line connected to the loop loading coils.

With regards to results, on 40 metres, I have made a record in the log of all comments regarding my signal, both on c.w. and s.s.b., and remarks like "You are the best signal on the band at present" and "Your signals are the best ever from 2SA" are common. Tests have been carried out with the United States and VK6 and VK5, and reports of 2 S units change on reversal of the phasing switch have been frequent. A report of 589 on c.w. was given by HP1IE and SSB7 from H3SAL.

If you decide to try the antenna and put it up higher than mine, the results should be fantastic.

FEEDBACK

Re the article "A Hub or Tri-band Spider Quads," "A.R." March 1970, p. 12-15. One point that was not made clear in this article is that "Spider Quads" must be "boxed" to increase the rigidity of the structure and to make it look as elegant as possible.

Boxing is achieved by connecting a number of the points, at which the loops are connected to the spreaders, together by means of non-conducting line such as 100 lb. breaking strain nylon fishing line, or a suitable woven line. These lines should run horizontally between the tie points and if the loops are attached directly to the spreaders will be identical to the desired spacing.—VK3ASC

★

BAIL ELECTRONIC SERVICES S.A. AGENT

Yuesu sole agent in Australia, Bail Electronic Services, have appointed Farmers Radio Pty. Ltd., 257 Angus St., Adelaide, as their S.A. representative; telephone 23-1268. Max Farmer (VK3GF) was one of the earliest manufacturers of two-way radio in South Australia, and has developed special p.a. equipment for use in tourist buses. Farmers' appointment, coupled with N.S.W. rep. Sandy Bruce-Smith, now gives three-State coverage for Bail Electronic Services.

EDDYSTONE BROCHURES

Technical brochures with full specifications of the range of Eddystone v.h.f.-u.h.f. communication receivers are now available from the sole Australian agent R H Cunningham Pty. Ltd., 608 Collins St., Melbourne, 3000.

VK-ZL-OCEANIA DX CONTEST, 1969 RESULTS

Our thanks to all who helped make this part of the Cook Bicentenary Celebrations the success it was. Everyone who submitted a log will receive a memento, Certificate and trophy winners will receive their awards direct while others will receive a "Participation Card" v/a QSL Bureaux.

While the greatest number ever of logs was received, more were expected from North America and Europe. It is disappointing that in spite of special direct publicity to DX Clubs, not one entry for this section was received. A reasonable critical comment in overseas logs was "Where were the ZL stations?"

While there are numerous exceptions, in general the easiest logs to check came from Japan with U.S.S.R. as runner-up. Many logs had to be re-scored as results will show but in general, logs were good.

In these results you will find the calls of many of the world's premier contest operators as prize winners, but the awards were structured in an endeavour to make provision for everyone. I hope we have been able to strike a balance to the satisfaction of all.

—Jock ZL2GX.

AUSTRALIA

| Call Sign | C.W. Section | | | | | Total |
|-----------|--------------|------|-------|------|-------|-------|
| | 30 | 40 | 50 | 15 | 10 | |
| VK1GD | — | 875 | 3450 | 1500 | — | 5825 |
| VK2APK | 155 | 1760 | 8565 | 7115 | 4405 | 22000 |
| VK2BE | 390 | 1480 | 4410 | 5850 | 5945 | 13875 |
| VK3VN | 215 | 1355 | 3675 | 4745 | 4505 | 14000 |
| VK3W | — | 675 | 1990 | 1630 | 3075 | 5370 |
| VK3W | — | — | 2430 | — | — | 2430 |
| VK3W | — | 2290 | — | — | — | 2290 |
| VK3K | — | — | 4815 | 1990 | 3105 | 8110 |
| VK3KX | — | — | — | 8055 | — | 8055 |
| VK3APN | 380 | 2910 | 2900 | — | — | 6190 |
| VK3BE | 190 | — | — | 5995 | 6155 | 6345 |
| VK3HE | — | — | 2730 | 225 | — | 2955 |
| VK3OP | 220 | 1555 | — | — | — | 1775 |
| VK3RJ | 565 | — | — | 685 | 1060 | 1910 |
| VK4FH | — | 5155 | 5335 | 4635 | 15175 | 16080 |
| VK4VX | — | — | 10995 | — | — | 10995 |
| VK4VX | — | — | 5300 | — | — | 5300 |
| VK4XJ | — | — | — | 5455 | 5425 | 10880 |
| VK4EZ | — | 4155 | — | — | 4185 | 8340 |
| VK4Q | — | 3975 | — | — | — | 3975 |
| VK4G | — | 3265 | — | — | 3285 | 6550 |
| VK4P | — | 1155 | — | — | 1165 | 2320 |
| VK4RF | Check | — | — | — | — | — |
| VK5MY | — | 530 | 9530 | 805 | 2760 | 5790 |
| VK5NO | — | 5170 | — | — | — | 5170 |
| VK5BS | — | — | 245 | — | — | 245 |
| VK5HJ | — | — | 9730 | 3265 | 4980 | 12775 |
| VK5CW | — | — | 3915 | — | — | 3915 |
| VK6Q | 680 | 1345 | 8940 | 3980 | 2880 | 15515 |
| VK7CH | — | — | 5930 | 880 | — | 6810 |
| VK8HA | — | 780 | 9750 | 5670 | 3550 | 12820 |
| VK9KS | — | — | 1425 | — | 1425 | 1425 |

Phone Section

| Call Sign | 30 | 40 | 50 | 15 | 10 | Total |
|-----------|-----|------|-------|------|------|-------|
| | 30 | 40 | 50 | 15 | 10 | Total |
| VK1GD | — | — | 3330 | — | 135 | 3465 |
| VK2KM | 510 | 2490 | 11610 | 6180 | 9480 | 27690 |
| VK2APK | 340 | 2150 | 10310 | 5640 | 4495 | 23335 |
| VK2XT | — | 495 | 8640 | 4810 | 6010 | 20755 |
| VK2SO | — | — | 1275 | — | — | 1275 |
| VK3WD | — | — | 3030 | 8980 | 9765 | 17775 |
| VK3AKV | 430 | 55 | 1415 | 3600 | 5265 | 9265 |
| VK3ASZ | 320 | 105 | 1320 | 1110 | 310 | 3965 |
| VK3Q | — | — | 2920 | — | — | 2920 |
| VK3BNK | 510 | — | 2160 | — | — | 2670 |
| VK3ER | — | — | 2330 | — | — | 2330 |
| VK3NS | 805 | — | — | 805 | — | 1610 |
| VK3AMK | 395 | — | 6980 | 1890 | 3435 | 12300 |
| VK3VK | — | — | 7280 | 2805 | 1345 | 11440 |
| VK3XB | 800 | — | — | 7335 | 8235 | 8870 |
| VK3ARX | — | — | 7615 | — | 7615 | 7615 |
| VK3W | — | — | — | 5810 | — | 5810 |
| VK3SM | — | — | 4485 | — | 4485 | 4485 |

| | | | | | | |
|--------|-------|------|-------|-------|------|-------|
| VK3ASQ | 198 | 55 | 1510 | 750 | 855 | 3360 |
| VK3BCL | 655 | — | — | — | — | 655 |
| VK3ASV | 210 | — | 55 | — | — | 265 |
| VK3KS | — | — | 13575 | 3790 | — | 17365 |
| VK3LT | 425 | — | 6245 | 3175 | 4710 | 14655 |
| VK3EE | — | — | 11620 | — | — | 11620 |
| VK3VX | — | — | — | 7755 | — | 7755 |
| VK3SF | — | — | 7735 | — | — | 7735 |
| VK3EQ | 360 | 55 | 2085 | 3030 | 2065 | 7615 |
| VK3AT | — | — | — | 2785 | 3280 | 6065 |
| VK3DO | — | — | 5100 | — | — | 5100 |
| VK3TZ | — | — | 3540 | — | — | 3540 |
| VK3U | — | — | 2260 | — | — | 2260 |
| VK3BG | — | — | 2165 | — | — | 2165 |
| VK3UA | — | — | 2000 | — | — | 2000 |
| VK3QA | Check | — | — | — | — | — |
| VK3PO | — | 535 | 7640 | 3235 | 2910 | 13710 |
| VK3WP | — | — | 3735 | 4010 | 3980 | 11725 |
| VK3ZZ | — | — | 1630 | — | 1630 | 3260 |
| VK3ZX | — | — | 1030 | — | 1030 | 2060 |
| VK3CT | 870 | — | 2965 | 4035 | 7610 | 14410 |
| VK3CW | 430 | 1135 | 5965 | 3005 | 3530 | 17765 |
| VK3TG | 660 | 1055 | 11670 | 4565 | 3830 | 21680 |
| VK3AZ | — | — | 328 | 10790 | 4875 | 15175 |
| VK3JV | — | — | 4005 | 4225 | 2825 | 10855 |
| VK3BM | 720 | — | — | — | — | 720 |
| VK3AL | — | — | 1900 | 1490 | 1180 | 3770 |
| VK3AJ | — | — | — | 1190 | — | 1190 |
| VK3RY | 535 | — | 230 | 4550 | 1575 | 6090 |
| VK3KS | — | — | 3640 | 2340 | — | 5380 |
| VK3HJ | — | — | 700 | 2320 | 1005 | 4025 |
| VK3RY | — | — | 305 | 770 | — | 1075 |

Individual Band Scores

| Band | Phone | C.W. |
|--------------------|--------------|--------------|
| All Bands | VK3KM 37890 | VK3APK 32000 |
| | VK3APK 33325 | VK3BE 18175 |
| | VK3APK 29795 | VK3BE 18175 |
| 10 mx | VK3VX 7785 | VK3XB 3985 |
| | VK3XB 7230 | VK3EE 5945 |
| | VK3CT 7010 | VK4FH 4635 |
| 15 mx | VK3XT 8140 | VK3VX 10090 |
| | VK3APK 6610 | VK3AKX 8050 |
| | VK3APK 5640 | VK3APK 7115 |
| 20 mx | VK3KS 13875 | VK3APK 8665 |
| | VK3SC 1775 | VK3VX 6170 |
| | VK3GK 11670 | VK3UA 6360 |
| 40 mx | VK3KM 3450 | VK3NO 5130 |
| | VK3APK 2155 | VK3APN 2810 |
| | VK3CW 1135 | VK3CW 2290 |
| 80 mx | VK3XB 880 | VK3GK 680 |
| | VK3NS 925 | VK3RJ 520 |
| | VK3NS 725 | VK3BE 520 |
| Special 80 mx only | VK3NS 805 | No Entry |

VK S.w.I. Section

| | | | |
|-----------|-------|-----------|------|
| W1A-L2023 | 13145 | W1A-L2021 | 2575 |
| W1A-L2250 | 19740 | W1A-L2001 | 3470 |
| W1A-L2181 | 8305 | W1A-L2011 | 3750 |
| W1A-L2385 | 8305 | W1A-L2143 | 3120 |
| W1A-L2485 | 55 | W1A-L2015 | 6520 |
| W1A-L2585 | 2760 | W1A-L2045 | 6160 |
| W1A-L2144 | 11370 | W1A-L2055 | 5410 |
| W1A-L2164 | 3670 | W1A-L2051 | 2400 |
| W1A-L2068 | 1760 | — | — |

S.w.I. Medalion won by W1A-L2021

NEW ZEALAND

| Call Sign | C.W. Section | | | | | Total |
|-----------|--------------|------|-------|------|------|-------|
| | 30 | 40 | 50 | 15 | 10 | |
| ZL1AH | 55 | 2460 | 9925 | 8365 | 4475 | 20180 |
| ZL1AH | 55 | 1765 | 6980 | 7880 | 3450 | 20030 |
| ZL1B | 55 | 3390 | 7105 | 3690 | 1810 | 16385 |
| ZL1RV | — | 530 | 7460 | 3260 | 2520 | 14470 |
| ZL1AMO | — | — | 3610 | 9360 | — | 12970 |
| ZL1HW | — | — | 6820 | 1890 | 2460 | 10550 |
| ZL1TZ | — | — | 7245 | 1195 | 2665 | 11100 |
| ZL1AFW | — | — | 3885 | 4775 | 2715 | 10885 |
| ZL1AZ | 135 | 1025 | 4865 | 1880 | 2570 | 10150 |
| ZL1RDM | — | — | 570 | — | — | 570 |
| ZL1NX | — | — | 3330 | — | — | 3330 |
| ZL1IB | — | — | 1775 | 110 | 1365 | 3250 |
| ZL1RD | — | — | 450 | — | — | 450 |
| ZL1FE | Check | — | — | — | — | — |
| ZL1CD | 100 | 1995 | 5395 | 5885 | 3060 | 15535 |
| ZL1AC | 110 | 1830 | 7440 | 4250 | 1000 | 15430 |
| ZL1BCO | — | — | 650 | 5650 | 2540 | 6500 |
| ZL1ZM | — | — | 10230 | — | — | 10230 |
| ZL1LB | Check | — | — | — | — | — |
| ZL1B | — | — | 5435 | 2635 | — | 8070 |
| ZL1B | — | — | 5145 | 2145 | — | 7290 |
| ZL1CP | — | — | 2545 | — | — | 2545 |

| | | | | | | |
|-------|-------|---|---|---|---|---|
| ZL1OP | Check | — | — | — | — | — |
| ZL1AG | Check | — | — | — | — | — |
| ZL1GR | Check | — | — | — | — | — |

Phone Section

| Call Sign | 30 | 40 | 50 | 15 | 10 | Total |
|-----------|-------|------|-------|------|------|-------|
| ZL1HW | — | — | 4675 | 2020 | 4580 | 13285 |
| ZL1AXB | — | — | 15360 | — | — | 15360 |
| ZL1AKX | 545 | 580 | 3310 | 1430 | 3820 | 8685 |
| ZL1AZ | 560 | 840 | 3340 | 1815 | 2445 | 8965 |
| ZL1TZ | — | — | 2835 | 5435 | — | 8270 |
| ZL1AFW | — | — | 4565 | — | — | 4565 |
| ZL1AG | — | — | 3635 | 1180 | — | 4815 |
| ZL1AFQ | — | — | 3815 | — | — | 3815 |
| ZL1RDW | — | — | 1565 | 1805 | 3470 | 6840 |
| ZL1RW | — | — | — | 2340 | — | 2340 |
| ZL1RD | Check | — | — | — | — | — |
| ZL1ACP | — | — | 8355 | 5040 | — | 13405 |
| ZL1ATZ | 640 | 1400 | 5920 | 3185 | — | 11220 |
| ZL1AVY | — | — | — | 4730 | — | 4730 |
| ZL1ZM | — | — | 2120 | — | — | 2120 |
| ZL1AVI | 140 | — | 890 | 880 | — | 2010 |
| ZL1AWH | 1280 | — | — | — | — | 1280 |
| ZL1GJ | 1890 | — | — | — | — | 1890 |
| ZL1AOP | 1015 | — | — | — | — | 1015 |
| ZL1B | — | — | — | — | — | — |
| ZL1DM | 690 | — | — | — | — | 690 |
| ZL1BCK | Check | — | — | — | — | — |
| ZL1B | Check | — | — | — | — | — |
| ZL1BQ | Check | — | — | — | — | — |
| ZL1NS | — | — | 10670 | — | — | 10670 |
| ZL1B | — | — | — | 5190 | — | 5190 |
| ZL1B | 1075 | — | — | — | — | 1075 |
| ZL1B | 335 | — | — | — | — | 335 |
| ZL1OP | Check | — | — | — | — | — |

Individual Band Scores

| Band | Phone | C.W. |
|--------------------|--------------|-------------|
| All Bands | ZL1AFQ 13405 | ZL1AG 2575 |
| | ZL1AW 13385 | ZL1AV 2515 |
| | ZL1AXB 13380 | ZL1AH 20080 |
| 10 mx | ZL1B | 5115 |
| | ZL1HW 4880 | ZL1B 5115 |
| | ZL1AVY 4940 | ZL1B 5115 |
| 15 mx | ZL1AFW 5435 | ZL1AMO 5130 |
| | ZL1ACP 8040 | ZL1AU 8390 |
| | ZL1AVY 4780 | ZL1AH 8930 |
| 20 mx | ZL1AXB 13380 | ZL1BQ 10230 |
| | ZL1B 10670 | ZL1B 10670 |
| | ZL1ACP 8365 | ZL1AU 8925 |
| 40 mx | ZL1AG 4565 | ZL1BQ 9350 |
| | ZL1GJ 1400 | ZL1AU 2430 |
| | ZL1AZ 1400 | ZL1B 1965 |
| 80 mx | ZL1AWH 1890 | ZL1BQ 945 |
| | ZL1AX 1070 | ZL1AZ 110 |
| | ZL1GJ 1030 | ZL1BQ 110 |
| Special 80 mx only | ZL1AWH 1890 | No Entry |

ZL S.w.I. Section

| | |
|-------|-------|
| ZL149 | 16265 |
| ZL180 | 3530 |
| ZL180 | 760 |

OVERSEAS

C.W. Section

| Note: Multi-op. stations indicated by (K) after call sign | | | |
|--|-------|----------|-------|
| Europe | | | |
| DM2BJD | 4864 | HAKPZ | 715 |
| DM2AND | 8046 | HAKDA | 312 |
| DM2BYL | 4864 | HAKDZ | 715 |
| DM2BSBM | 418 | HAKPH | 312 |
| DM2BHK | 73 | HAKS | 1815 |
| DM2ATD | Check | PAPAC | Check |
| DM2CHM | Check | PA67 | Check |
| DM2HJH | Check | LAIK | 1809 |
| DM2HJH | Check | LA5ME | 1809 |
| DM2HJH | Check | LA5VF | 48 |
| DL7AA | 5120 | LA1H (K) | 5100 |
| DL7B | 5120 | OK27 | 2620 |
| DL7KX | 3303 | OK2QX | 450 |
| DL7SG | 4 | OK1STU | 450 |
| DL7B | Check | OK27 | 2620 |
| DL7TA | Check | OK2BCI | 475 |
| EZ1AA | 160 | OK1AFN | 158 |
| EZ1B | 160 | OK1DLM | 180 |
| FD7W | 72 | OK1TA | 158 |
| F8TQ | 72 | OK3CFL | 144 |
| GW5W | 2244 | OK2STP | 144 |
| GW5P | 1406 | OK2STP | 144 |
| GW5V | 1406 | OK1XVS | 144 |
| HA7AGA | 450 | OK2UL | 80 |
| HK6CPS | 450 | OK4CC | 80 |

[illegible]

Report from Secretariat, I.A.R.U. Region 3 Association, to the Federal Council, W.I.A.

Gen. Year.

Last year, at Canberra Convention, I reported as Federal President on the activities of the Institute, the Executive, and the Secretariat in attempting to formulate an Interim Constitution and to establish a Directorate of the Region 3 Association. It was stated that the draft constitution brought to the surface some widely divergent views from other countries resulting in a series of amendments which were incorporated in a further draft constitution. The Institute at Canberra, through Mr. Mull, had approved the Interim Constitution, and since that time the Interim Constitution has received the approval of the Directors from Japan, Philippines and New Zealand. The Secretariat determined that as a result of this approval, the I.A.R.U. Region 3 Association formally came into existence on 1st July, 1963. It took 18 months from the time the Institute agreed to call a meeting with the aim of forming an organization, until the time the organization was formally established.

During this period, the work of Federal, Vice-President David Rankin, VK3QV, was invaluable, and the Interim Secretariat benefited greatly from his advice on international matters. Mr. Rankin was also called to report appointment to the Secretariat due to pressure of work, and the resignation of his office in the Institute, I.A.R.U. Region 3 Association is indebted to him.

The Association is also greatly indebted to the W.I.A. Federal President and Secretariat for the assistance and advice given during the detailed and arduous work connected with the formulation of rules embodied in the Interim Constitution. A set of rules acceptable to four countries of widely different legal and social backgrounds could be drafted, circulated, amended, re-circulated and finally approved in what I believe is a relatively short time considering the difficulties of communication within the Region.

Having been formally come into existence, the Secretariat consisting of Messrs. P. Williams, VK3IZ, M. Owen, VK3XJ, D. Wardlaw, VK3ADW, M. Mull, VK3EZ, commenced working. The first step was to take 10 minutes for circulation to the Directorate. The Secretariat prepared a 22-page document in July-1963, and it was circulated to the I.A.R.U. HQ, Region 1 Division, Region 2, I.A.R.C. J.A.R.L. N.Z.A.R.T. P.A.R.S. W.I.A. and the secretaries of Amateur Radio Societies. The Bureau of the I.A.R.U. in Hong Kong, India, Korea, Nepal, Thailand, Singapore, Indonesia, Pakistan, New Caledonia, Fiji, Okinawa. This material was also sent to the respective Amateur Radio operators in Iraq, Afghanistan, Laos, Western Samoa. A point of contact in China, Cambodia and Taiwan was known to the Secretariat.

This material, which was also forwarded to Federal Councillors, contained a record of discussions in Sydney, a statement from the Sydney Congress, a statement of the I.T.U. Conference agenda, a copy of the Interim Constitution; a four-page explanatory covering letter, and a questionnaire. The Secretariat felt that the material was being sent out up to date, and explain the nature of the organization which had been formed to assist in the advancement of Amateur Radio in the Region.

At the second meeting of the Secretariat, called for September 1963, it was resolved to prepare a list of countries to which the circular material had been received. We anticipated some questionnaires returned, and at least some acknowledgment from the 24 societies contacted. We related to report that the response is disappointing, and we have from time to time wondered whether the material was being passed on to the respective radio systems. Acknowledgment has recently been received from some countries, viz. Japan, New Zealand, Western Samoa; so we have renewed the material to the Secretariat.

Gentlemen this brings me to the point where I wish to state what I see as the greatest barrier to success of the I.A.R.U. Region 3 Association. We must, I believe, establish a firm contact with a person or persons in the countries of the region. Material sent in a printed form will never be read, and the potential of a Society seems not to be the way to maintain effective liaison, and seems to be an ineffective way to maintain contact. Many ways to improve communications and liaison suggest themselves.

1. Personal contact (that can be of several forms) is the most effective way. It would be for some person from the Secretariat to actually go to these countries and search out a person connected with the Amateur

Society and request that he convene support for the Association, and be the known point of contact. This would be costly if it did not achieve the objectives. It would require a good investment if it did achieve better liaison and establish effective communication. The Institute took the initiative in getting the Association off the ground. The Institute have to take the initiative in keeping it airborne.

An alternative is perhaps to call a conference of Region 3 representatives, held centrally in South East Asia to which would travel from nearby countries could travel. This would have the added advantage that the forthcoming I.T.U. Conference could form the crystallizing influence to such a Conference, and that such a Conference could have wider publicity value than a "whistler stop" tour. Perhaps it is necessary for both activities to be considered.

In summary, I believe that personal contact must be established and maintained even though it is a costly business. Correspondence seems to be less costly, but less effective.

3. Radio contact. This seems obvious to a group of communicators who are equipped to maintain communication by radio throughout the Region. In this matter, the Secretariat will give attention to almost immediately. Comments have been passed to the Secretariat about the use of the well-established "Sea-Net", in 30 minutes each. Over the past 18 months I have felt loth to use this somewhat private net for Region 3 Association purposes, without invitation. Perhaps this is being too sensitive, and the overheads should be worked further. The very useful skeds I held in the past with WIKKE of A.R.R.L. and GEBVN of I.S.G. and others, have been very helpful. Skeds with Regional representatives at least weekly should be possible, and may do much to improve liaison. The Secretariat is examining this aspect at the moment.

Notwithstanding the difficulties of communication, much informal and formal correspondence has ensued between the Secretary-General and I.A.R.U. Secretariat, and the Secretary-General and Region 1, also from time to time between the Secretariat and other countries, especially the Directors. Of recent months, an increasing number of letters have appeared, most of the correspondence has been concerned with the forthcoming I.T.U. Conference, and the Secretariat has been in touch with the communications from overseas in his capacity as a Region 3 officer, and the Federal Secretary of the W.I.A. receives communications from overseas, that capacity that he is able to do both organizations that the same person holds these offices, and while the function of the Federal Secretary is to be the overseas liaison officer, he should be closely connected to the Region 3 Secretariat while Australia is providing the personnel. Other countries have secretaries, and the overseas liaison officers are the Region 3 Directors for J.A.R.L. and N.Z.A.R.T. While Australia provides the Secretariat I believe that the officer responsible for W.I.A.'s overseas liaison, whoever he is, and by whatever he is designated, should be close to the Secretariat.

In material sent out recently to the Directors, the Secretariat has been asked to submit opinions on several matters. I have placed these before the Institute for determination in Adelaide, if they appear on the agenda paper. I refer to:-

1. Item 3.2 regarding the calling of a regional conference this year. You will recall that the next I.T.U. Conference was scheduled for 1971 in Tokyo, but the calling of an I.T.U. Conference in that year has altered opinions, and we have asked the Directorate for some guidance.

2. Item 3.3 regarding the formulation of a regional policy regarding the 1971 I.T.U. Conference. The Secretariat has been asked to prepare a policy for the Adelaide Convention on the assumption that a regional policy should be determined. Japan and New Zealand have indicated that they would like to have a working study group and the like in order to determine their own policy, and will communicate their views to the Secretariat.

3. Item 4.1 regarding the proposed "General Regulations" submitted by the N.Z.A.R.T. Director. These have been modelled on I.T.U. Conference rules, and have been submitted in detail. I believe they represent a fair set of rules of procedure should we consider the calling of a regional conference in the near future. I have indicated to the Secretariat that you for adoption so that the W.I.A. vote on the N.Z.A.R.T. proposal can be forwarded to the Secretariat.

During the debates on these Items, I propose to put the views of the Secretariat on these matters, and follow their resolution. I will

through the Secretariat convey the views of the W.I.A. to the other Directors and the Region generally. It is perhaps fortuitous that the I.A.R.U. Region 3 Association has formally come into existence at precisely the same time as the Amateur Service is faced with a possible threat to its frequencies. One of the major objectives of the Association is the preservation of frequencies and with that objective in view, the Secretariat hopes for some of the more spectacular achievements in the coming year.

I wish finally to report on some administrative and internal matters. You will have noted the opening of the Association, that a bank account has been opened and the first of the three W.I.A. contributions has been paid to the Secretariat. The J.A.R.L. has indicated that they wish to remit the sum of \$500.00 Yen before the end of March and they have been invoiced for this amount by the Secretary-General.

You will have noticed from the correspondence that the Secretariat has decided to adopt as a motif that as adopted by Region 1 and Region 2, with the map of Region 3 as a different centrepiece. The Secretariat is investigating the matter of having some stationery printed, and it has been suggested that the use of paper issued by the International organization be that of an international metric standard size.

Local correspondence has been initiated between the Secretariat and Mr. Pierce Healy, VK3APQ, in relation to the publication of a bulletin, and in relation to his appointment as Editor. The bulletin will be published on behalf of the Region by the Secretariat and prepared on behalf of the Secretariat by the Region. There has been much correspondence to the Secretariat from other countries for inclusion in a bulletin to date, but we hope and expect to improve our channels of communication.

Both the Federal Secretary and I have raised the matter of the position of W.I.A. Director in relation to the annual Convention. This matter has been discussed with Mr. Rankin, but which I hope will be discussed in Adelaide. I have endeavoured to keep you up to date with Regional matters by sending you a circular letter, and I will continue to do so in my capacity as Region 3 Director—this is one of the advantages of being the Regional Secretary, it is a simple matter to obtain extra copies for you.

In conclusion, whilst the past year could not be called one of spectacular achievement, nevertheless it is one of significant achievement, and above all, a firm base has been laid on which to build—admittedly slowly, but we believe surely. Over the past 18 months we have waited for the countries in the Region to ask the Secretariat to do certain things—the result of this approach has been disappointing. I believe the Institute, through its Director has to initiate in a positive way, and that this initiative has to be changed through the continued efforts of the Secretariat. The objectives for which the I.A.R.U. Region 3 Association was formed. You have appointed the Secretariat, and we are now waiting for the Secretariat, who have all worked very hard during the past 18 months since the Institute first suggested the setting up of a Region 3 organization.

Looking at the matter from the point of view of the Institute, I consider that the Region 3 organization must be given encouragement in the form of a possible way by the Institute. In the long term, the publicity of the Amateur Service must be established within those countries which are as yet not only not members of the Institute, but are also not yet Amateur oriented. The means by which this can be achieved may be a matter of debate. The usual Amateur activities such as contests and QRP, etc., may offer the most effective way to make the Region 3 organization a viable Amateur organization. The activities of the Region 3 Association seem dependent on the leadership that our organization is prepared to exhibit.

Finally, but not least by any means, both the Institute and the Region owe a debt of gratitude to Mr. VK3QV for his hardworking Region 3 General in a formal capacity, but who for many years has been doing a great deal of the work, and everything he could to foster this organization. I hope he retains this very special interest in the I.A.R.U. Region 3 Association for many years to come. I believe the potential is great for great things—dependent on the enthusiasm of its officers and your continued support.

Signed, J. Battison

is a Yaesu FDX400 at 24 MHz. On 1200 MHz, Will uses a solid state converter with crystal mixer, 30 MHz i.f., 3CX100A5 tripler from 432 to 1296 which is driven from varactor tripler, 15w input, to the 3CX100A5, antenna 4 ft. home brew dish with dipole feed.

For s.s.b. purposes Will uses a home-brew h.f. phasing rig on 14 MHz, with transverters. His antenna systems are rather low, but he points out that this is due to a combination of factors. Living in rented premises, he cannot stay in Burnie unknown, excellent QTH anyway and lack of time to lift them higher due to 432 and 1296 MHz building programme.

Will has worked all States from VK1 to VKD inclusive on 70, 144 and 3 MHz, and VK2, 3, 4, 5 and 7 on 144 MHz. On 432 the area is Geelong, Birchip and Melbourne in VK3, and a "scratch" contact to ML Gambier, Melbourne and Geelong are his contact areas on 1296 MHz. He holds a certificate for Worked All States on 30 MHz, and was the VK1 Ross Hull Contest winner in 1969/70. A note in May 1970 "A.R." Will won the VK1 Ross Hull Award for 1969/70.

During former years, Will was Secretary of the VK1 V.F. Group, Vice-President, North West Zone in 1968. Looking to the future, he has his eyes on contacts to Adelaide area on 432 and 1296 MHz, and given a reasonable chance he hopes to get there.

In the photograph depicting Will's gear, from left to right we see the 432 varactor tripler/Alter and 1296 tripler are in little boxes, rack contains 1 and 8 metre transverters, 2 metre inverter, the 5 metre varactor mounted in the space at the bottom of rack, then s.s.b. exciter and FDX400 receiver on right. The 432 final tests on the roof.

So there's a man to keep an eye and ear open, we've got the gear, and the location, most of the remainder is up to you at the other end.



Thank you Doug for your letter, the information is very helpful, and gives us down here just a little idea of what you must be enjoying in the north.

Finally, very pleased to receive my QSL card from Doug VK2BKZ confirming 144 MHz. contact with him during Feb. And I guess there will be many others just as pleased to receive theirs, some 66 others in fact! Will these kind enough to send me copy for inclusion in "A.R." please ensure it arrives here by 30th of the month at the very latest, a day or two earlier would be preferable.

Anything beyond the 30th inevitably must be left a month, and frequently the news is then outdated. Your co-operation is gratefully sought.

That's all the news for this month, nothing received from VK3 or 4. Always pleased to hear from anyone. This thought for the month: "Dogs are much like people. Usually only one in a group is barking at something in particular, the others are barking at him."

Until next month, 73, Eric VK5SLP. "The Voice in the Hills."

VK2 MID-WINTER V.H.F.-U.H.F. CONTEST 1970

The Contest Committee of the VK2 V.h.f./T.v. Group invites all Amateurs and S.W.s with v.h.f. and/or u.h.f. equipment to participate in the 1970 Mid-Winter Contest. This will be held during the Queen's Birthday week-end in June. Copies of these rules are being sent to all States and ZL, welcoming distant QSOs.

Date/Duration.—Contest starts Sat., 13/5/70 1400 hrs. (E.A.S.T.) and finishes on Mon 15/5/70 1300 hrs. with rest periods.

The operating times are:
Sat 14/5/70—1400 hrs to 2200 hrs (8 hrs.)
Sun 14/5/70—0800 hrs to 1100 hrs (3 hrs.)
Sun 15/5/70—1200 hrs to 1500 hrs (3 hrs.)
Mon 15/5/70—0800 hrs to 1200 hrs (4 hrs.)

There are two time divisions for which entries may be submitted Division "T" for the Total, or overall contest duration, and Division "S" for the best scoring six consecutive hours which may, if desired, be broken by one of the rest periods; e.g. from 2000 hrs. Sat. night to closing at 2200 hrs. Sun. morning to 1100 hrs. Sun., and 1200 hrs. to 1300 hrs. is accepted as six consecutive contest hours.

Entries may be submitted for either Division "T" (Total) or Division "S" (Six hours), or both of these, but the winner of Division "T" will not be eligible to also win Division "S".

The various classes in which participants may enter are:

- Class H—Home Station.
- Class M—Mobile Station.
- Class P—Portable (field) Station.
- Class S w/1—Liaison, Home Station.

A station may enter in more than one class if satisfying the conditions, e.g. he could work from home, then go mobile and then portable.

One scoring contact per station is allowed in every one "clock hour" for each band a station can work. One contact per clock hour means one QSO between, say, 1300 hrs. and 1400 hrs. It is not necessary to wait a full hour to have a second scoring QSO with the same station on the same band, e.g. "A" works "B" at 1258 hrs., they may then work again any time from 1300 to 1359 hrs., and their following QSOs are between 1400 and 1459 hrs. and so on.

A mobile station may work the same station within the hour period providing he has increased his distance from that station by more than 10 miles.

Serial Numbers must be exchanged as usual before points may be claimed for a contact. The five or six digit serial number to be the RS report (RST for telephony) followed by three digits starting as shown below and increasing by one for each successful contact.

- For all 6 metre QSOs start at 801
- For all 2 metre QSOs start at 201
- For all 432 MHz QSOs start at 401
- For all other UHF t.v. start at 001

Note that the numbers for Net QSOs are to be in the same sequence of numbers as for the whole band.

Stationers should be sent to reach the Secretary, V.h.f./T.v. Group, Wireless Institute Centre, 14 Atchison Street, Crews Nest, N.S.W., 2066, by Friday night, 17th July, 1970.

The committee would appreciate all comments on the Contest and all entries even if you were not contest station. Entries can be sent to Bill O'Donnell, VK2ZBU, 41 High St, Willoughby, N.S.W. 2068, or in business hours 406-5355 Sydney STD 02. If any station intends to operate in the field the committee would appreciate notice of the station's location so that all concerned can be notified.

TABLE OF INCENTIVE RATINGS AND MULTIPLIERS

| Category | Rating | 6 and 2 mX Nets | Home/Port./Mobile | 58 and 144 MHz | Tune: Home | 58 and 144 MHz | Tune: Mobile | 70 cm (432) Net: Home | 70 cm (432) Net: Mobile | 430 and 576 MHz: Home | 430 and 576 MHz: Port./Mobile | 1215 MHz | Port./Mobile | 2.3 to 10 GHz: Home | 2.3 to 10 GHz: Port./Mobile | 21 GHz: Home | 21 GHz: Port./Mobile |
|-----------------|--------------------|-----------------|-------------------|----------------|------------|----------------|--------------|-----------------------|-------------------------|-----------------------|-------------------------------|----------|--------------|---------------------|-----------------------------|--------------|----------------------|
| 6 and 2 mX Nets | Home/Port./Mobile | 1 | 2 | 4 | 5 | 4 | 5 | 10 | 11 | 19 | 17 | 20 | 21 | 23 | 24 | | |
| 58 and 144 MHz | Tunable Home | 3 | 4 | 6 | 7 | 6 | 7 | 12 | 13 | 18 | 19 | 22 | 23 | 25 | 26 | | |
| 58 and 144 MHz | Tunable Port./Mob. | 4 | 5 | 7 | 8 | 7 | 8 | 13 | 14 | 19 | 20 | 23 | 24 | 26 | 27 | | |
| 70 cm (432) Net | Home | 3 | 4 | 6 | 7 | 6 | 7 | 12 | 13 | 18 | 19 | 22 | 23 | 25 | 26 | | |
| 70 cm (432) Net | Port./Mobile | 4 | 5 | 7 | 8 | 7 | 8 | 13 | 14 | 19 | 20 | 23 | 24 | 26 | 27 | | |
| 430 and 576 MHz | Home | 9 | 10 | 12 | 13 | 12 | 13 | 18 | 19 | 24 | 25 | 28 | 29 | 31 | 32 | | |
| 430 and 576 MHz | Port./Mobile | 10 | 11 | 13 | 14 | 13 | 14 | 19 | 20 | 25 | 26 | 29 | 30 | 32 | 33 | | |
| 1215 MHz | Home | 15 | 16 | 18 | 19 | 18 | 19 | 24 | 25 | 30 | 31 | 34 | 35 | 37 | 38 | | |
| 1215 MHz | Port./Mobile | 16 | 17 | 19 | 20 | 19 | 20 | 25 | 26 | 31 | 32 | 35 | 36 | 38 | 39 | | |
| 2.3 to 10 GHz | Home | 19 | 20 | 21 | 22 | 21 | 22 | 26 | 27 | 34 | 35 | 38 | 39 | 41 | 42 | | |
| 2.3 to 10 GHz | Port./Mobile | 20 | 21 | 23 | 24 | 23 | 24 | 29 | 30 | 35 | 36 | 39 | 40 | 42 | 43 | | |
| 21 GHz | Home | 22 | 23 | 25 | 26 | 25 | 26 | 31 | 32 | 37 | 38 | 41 | 42 | 44 | 45 | | |
| 21 GHz | Port./Mobile | 23 | 24 | 26 | 27 | 26 | 27 | 32 | 33 | 38 | 39 | 42 | 43 | 45 | 46 | | |

To find the Multiplier for a contact, ADD the ratings of the two stations, OR in the above chart, select the horizontal row corresponding to the category of one of the stations. Then select the vertical column for the category of the other station. The number in the last pair of stations is the number shown at the intersection of these two lines.

VK2WF—see text for outline of equipment

GENERAL NEWS

Of new contacts to those in other States is that interest in repeaters is growing in VK3, experimental equipment has been built and tested. The last meeting of the group was held with 14 members present and Garry VK2KZ was elected co-ordinator of the group.

Doug VK2BKZ in Darwin, sent me a letter which just missed out on the closing date for copy last month. However, much of the information in the letter is of general interest. He reports first trans-equatorial openings to Japan from Darwin occurred on 16th February this year and lasting from 1830 to midnight. TE signals got up to over 80 most evenings, but a.m. signals are very hard to copy even with 100% modulation. He notes with surprise that Br. V.F. stations mainly TE with TE occasionally, from 1330 to midnight, whilst those living in Cairns, Rockhampton and Carcassonne are similarly treated. David VK2AAJ in Tennant Creek gets P2 about sundown, followed by mostly P3 with TE. So there is plenty of variety in the north.

Doug and David have been keeping regular h.f. contacts with WA6BY, W6BML and W6RA from 0918 to 1100 E.S.T. on Saturdays and Sundays, confirming they are on 28.533 MHz, 28.135 MHz and 28.135 MHz. Doug heard although the W6s are running 800w output to stacked 8 el. yags! Meet We use 501 to 501.25 as their DX channel, in New Orleans there is now a station, KC6GJ, beaming south midnight to 1400, on 501.05, running 300w or 800w, on demand.

The JAs have been working KX6ER on 52.1 m. in the Marshall Is. But Doug had not worked him at time of writing. DUJPH reports there is little DX activity in the Philippines as most of the locals are now tied up in a net frequency.

NEW CALL SIGNS

JANUARY 1970

VK1KO—R. K. Westbrook, 9 Kaines St., Cordis, 3083.
 VK1ZHG—G. R. Hovey, Station: University House, Acton, 3531, Postal: P.O. Box 4, Canberra, 2600.
 VK1GS—N. J. Stewart, 131 Bradford Rd., Lindfield, 2070.
 VK1JG—N. S. Hill, 14/749 Pittwater Rd., Dee Why, 2099.
 VK1OA—School of Applied Electricity, Sydney Technical College, Harris St., Ultimo, 2007.
 VK1QA—N. M. Doyle, 43 Pine St., Randwick, 2231.
 VK1BCD—L. D. Christolm, 86 Raglan St., Manly, 2095.
 VK1BFE—P. Ellensmere, 86 Pringle Ave., Belmore, 2221.
 VK1BGG—J. G. Griffiths, 10 Anne St., Wauchope, 2448.
 VK1BKJ—J. T. Kalopodis, 24 Walton St., Blakehurst, 2221.
 VK1BLW—K. J. Watson, 6 Porter Ave., East Maitland, 2323.
 VK1BSE—Australian Boy Scouts Association, 1st Epping Group, Station: 6 Essex St., Epping, 2121; Postal: P.O. Box 55, Epping, 2121.
 VK1ZMG—A. B. Mitchell, "Arrawatta," Inverell, 2393.
 VK1ZQ—R. K. Graham, 12/316 Victoria Rd., Ryde, 2112.
 VK1ZQR—R. C. Quick, Flat 4, 17 Kenrick St., The Junction, 2391.
 VK1ZVJ—B. J. Lacey, 1 Chapman St., Ulanterra, 2385.
 VK1CD—A. Campbell-Drury, 16 Colchester Dr., East Doncaster, 3108.
 VK1JV—A. W. Adams, 46 Margate Cres., Glen Waverley, 3150.
 VK1BAZ—J. E. Kerr, 71 Wattle Gr., Springvale North, 3170.
 VK1BAY—R. M. Bruce, (Recorded as VK1BAU in June-September List).

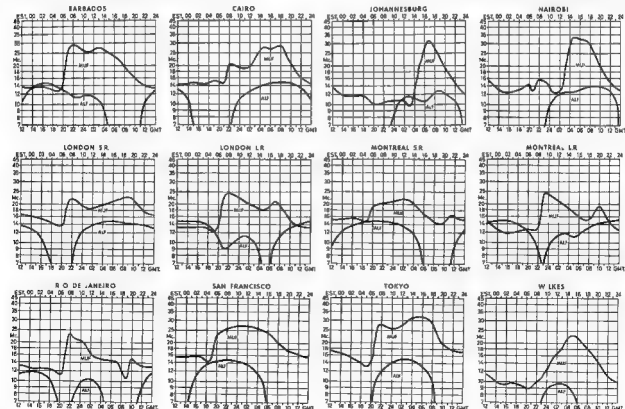
VK1BBG—R. A. Jones, 18 Morley Crt., Karingal, 3188.
 VK1BRI—L. Brettlav, 48 Pennell Ave., St. Albans, 3021.
 VK1BRP—J. R. P. Vize, 11 Mossman Dr., Heidelberg, 3084.
 VK1RRP—H. J. Morere, 4 Plunket St., Brighton East, 3187.
 VK1BRC—R. A. E. M. E. Training Centre Amateur Radio Club, R.A.E.M.E. Training Centre, Sandians, 3694.
 VK1BCC—J. L. Voeke, 21 French St., Mt. Waverley, 3149.
 VK1BCE—M. E. Merre (Mrs.), 4 Plunket St., Brighton East, 3187.
 VK1BCK—J. C. Alger, 55 Vears Rd., Burwood, 3125.
 VK1BCR—H. G. Austin, Quantong, Horsham, 3600.
 VK1BCX—G. R. Mintern, Kanumbra, 3715.
 VK1BRF—P. Scherck, 11 Waverley St., Sandringham, 3181.
 VK1YAI—P. Y. Harris, 1312 Centre Rd., Clayton, 3168.
 VK1YAJ—L. G. Milne, 7 Alexander Ave., Mornington, 3931.
 VK1YBK—G. W. Jolliffe, 30 Ludbrook Ave., South Caulfield, 3162.
 VK1SYB—R. H. Wales, Samaric Roadside, Baulkham, 3072.
 VK1SBP—T. J. Robinson, 53 Warrandyte Rd., Ringwood, 3134.
 VK1SYQ—W. A. Wright, 16 Lincoln Dr., Cheltenham, 3192.
 VK1SYR—R. N. Well, 31 Hutton St., Dandenong, 3175.
 VK1SYU—J. J. Cohen, 15 Cambro Rd., North Clayton, 3168.
 VK1SYV—R. E. Jenkins, 403 Pascoe Vale Rd., Strathmore, 3041.
 VK1SYW—C. B. Wallace, 22 Norwood Rd., Caulfield North, 3161.
 VK1SYX—D. M. Hunt, 341 Waterdale Rd., Heidelberg West, 3051.
 VK1SYZ—D. Andrews, 159 Princes Hwy., Droun, 3121.
 VK1SYC—J. A. Wright, 345 Whitehall St., Yarraville, 3013.
 VK1SYD—J. E. L. Emery, 5 Carmel Crt., Karingal, 3189.

VK1YCC—C. D. Beeforth, 10 Haig St., Mornington, 3931.
 VK1YCH—M. C. Loxton, 5 Goldthorne Ave., East Kew, 3123.
 VK1YCI—A. J. Jeffery, 43 Millwaite Ave., Chadstone, 3168.
 VK1YCN—R. N. Elms, 18 Heritage Dr., Springvale, 3171.
 VK1YCR—J. De Jong, 8 Collier Ave., Upwey, 3188.
 VK1YCY—L. R. Johnston, Flat 2, 798 Warrigall Rd., Oakleigh, 3166.
 VK1YCU—W. I. Rise, 40 Golf Rd., South Oakleigh, 3167.
 VK1YCV—J. J. Rainbridge, Midland Motel, Mooroonpa, 3028.
 VK1YCK—P. A. McGill, 22 Grace St., Laverton, 3028.
 VK1YFJ—J. Bruce, 5 Shadwell St., Cheltenham, 3192.
 VK1ZQC—N. K. Langmaid, 3 Narrulan Ave., Yabburn, 3028.
 VK1YQ—A. B. Foster, 6 Warren Crt., Aitkenvale, 4814.
 VK1LP—J. S. Hanham, Station 13 Burton St., Boroan, 4304, Postal: C/o Officers Mess, R.A.A.F. Base, Amberley, 4305.
 VK1MS—W. R. McLaughlin, Unit 2, Lucella Crt., 1 Burnside Blvd., Surfers Paradise, 4217.
 VK1RL—R. J. Hoare, 18 Wendover St., Grovely, 4054.
 VK1UF—J. F. Fisher, 311 Ingham Rd., Garbutt, 4814.
 VK1YF—S. L. Pittell, 7 Channon St., Glympie, 4570.
 VK1ZAG—C. E. D'Alton, 30 Baylis St., Toowoomba, 4005.
 VK1ZF—J. E. R. Dunkley, 9 Elva Ave., Poona, 5007.
 VK1NZT—E. T. Schoell, 33 Avenue Rd., Highgate, 5083.
 VK1QH—R. L. Mayfield, 35 Astrid Ave., Warra, 3608.
 VK1BO—C. F. Williams, 23 Laidlaw St., Henley Beach, 5052.
 VK1ZFP—J. T. Parrall, 12 Warren Ave., Glenislie North, 5045.
 VK1ZFS—R. E. Warrnett, 18 Cudmore St., Somerton Park, 5044.

(continued on page 23)

PREDICTION CHARTS FOR JUNE 1970

(Prediction Charts by courtesy of Ionospheric Prediction Service)



VK ACTIVITY ON 160 METRES, CHECKED IN VK6

The following table is an analysis of VK calls heard on 160 metres for 1968 and 1969, showing monthly figures. The number of daily checks in 1968 was 256, and in 1969 was 233. All calls were counted once only on any one date.

| 1968 | | | | | | | | | |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Activity on 89 days | | | | | | | | | |
| | VK1 | VK3 | VK4 | VK5 | VK6 | VK7 | VK8 | VK9 | VK0 |
| Jan. | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar. | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Apr. | 0 | 14 | 0 | 3 | 0 | 4 | 0 | 0 | 0 |
| May | 0 | 27 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Jun. | 0 | 1 | 0 | 4 | 13 | 2 | 0 | 0 | 0 |
| Jul. | 1 | 3 | 0 | 13 | 3 | 1 | 0 | 0 | 0 |
| Aug. | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Sep. | 0 | 27 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Oct. | 0 | 12 | 0 | 1 | 9 | 1 | 0 | 0 | 0 |
| Nov. | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec. | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| Totals | 1 | 73 | 0 | 31 | 31 | 10 | 1 | 0 | 1 |

| 1969 | | | | | | | | | |
|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Activity on 103 days | | | | | | | | | |
| | VK1 | VK3 | VK4 | VK5 | VK6 | VK7 | VK8 | VK9 | VK0 |
| Jan. | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr. | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 9 | 0 | 1 | 4 | 3 | 0 | 0 | 0 |
| Jun. | 0 | 11 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Jul. | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug. | 0 | 17 | 1 | 10 | 4 | 0 | 0 | 0 | 0 |
| Sep. | 1 | 38 | 0 | 16 | 18 | 0 | 0 | 0 | 0 |
| Oct. | 0 | 19 | 0 | 4 | 7 | 0 | 0 | 0 | 0 |
| Nov. | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Dec. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 |
| Totals | 4 | 132 | 4 | 44 | 58 | 4 | 0 | 0 | 0 |

The following separate calls were logged in the above:

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the total number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE

| | | | |
|--------|---------|--------|---------|
| VK5MB | 216/340 | VK5AB | 297/314 |
| VK5RU | 214/339 | VK4ES | 293/308 |
| VK3AHQ | 211/336 | VK4FJ | 287/307 |
| VK4HR | 210/335 | VK4F7 | 286/306 |
| VK5J7 | 207/335 | VK2APK | 277/323 |
| VK5MK | 205/323 | VK5TL | 271/277 |

New Members:

| | | |
|-----------|-------|---------|
| Cert. No. | Call | Total |
| 108 | VK5XY | 106/106 |
| 109 | VK5XK | 101/101 |

Amendments:

| | | | |
|--------|---------|-------|---------|
| VK5JE | 244/247 | VK5JW | 201/202 |
| VK4UC | 217/217 | VK5NM | 189/189 |
| VK5AMK | 215/216 | VK4RF | 169/169 |

G.W.

| | | | |
|--------|---------|--------|---------|
| VK5AHQ | 201/315 | VK5APK | 274/282 |
| VK3QL | 200/323 | VK5NC | 274/300 |
| VK4FJ | 200/315 | VK5XB | 270/287 |
| VK4HR | 207/308 | VK5AK | 270/279 |
| VK5AGH | 202/296 | VK5RU | 269/289 |
| VK5YL | 272/282 | VK4TY | 250/272 |

Amendments:

| | | | |
|-------|---------|-------|---------|
| VK4RF | 158/164 | VK5ES | 138/138 |
|-------|---------|-------|---------|

OPEN

| | | | |
|--------|---------|--------|---------|
| VK5RU | 315/340 | VK5MK | 304/324 |
| VK4HR | 214/339 | VK5EO | 302/322 |
| VK5ACX | 312/323 | VK5F7 | 290/305 |
| VK5VN | 308/328 | VK5ALX | 285/304 |
| VK4SD | 306/331 | VK5APK | 294/305 |
| VK5TY | 306/331 | VK5ES | 294/315 |

Amendments:

| | | | |
|-----------|---------|-------|---------|
| Cert. No. | Call | Total | |
| 123 | VK4QF | 100 | |
| VK5NC | 275/286 | VK4RF | 219/231 |
| VK4UC | 228/259 | VK5XK | 136/137 |

1968: VK5RGH, VK5: ABR, ACH, APF, APN, ATH, KD, GR, GU, NW, RJ, RZ, TB, XH, XJ; VK5: RS, KQ, L.A, RC, VK5: AI, CB, EZ, NK, ZW, VK5MZ, VK5GN

1969: VK5: AKL, BF, VK5: ABR, ACA, ACH, APV, ARN, AMA, AML, APA, APN, AQ, ARL, ATN, ATN, AUJ, ACK, AVI, AZD, CV, GU, KP, KS, NW, RJ, TB, XH; VK5AH; VK5: DS, FM, GL, JQ, KG, KO, LP, RO; VK5: AI, CW, NK, ZW, VK5MZ

George Allen, WIA-L6942

MUNICH OLYMPIC DIPLOMA (M.O.D.)

The D.A.R.C. "Ordnance" of the Olympic City of 1972 invite all Radio Amateurs of the world to participate in the Amateur Radio friendship activity of the Olympic Games 1972. The Munich Olympic Diploma is established for this purpose. The requirements are:

1. All contacts with stations in Munich, from 1st January 1970, 0000 GMT, to 3000 GMT of the day of the official closing of the Olympic Games 1972, will count for the award.
2. For the purpose of this award, all stations located in the "DOX" C-49, C-11, C-12, C-13, C-18 or C-30 are considered as Munich stations.

3. Contacts with Munich stations are credited the following points:

German participants, Phone 3 pls, C.w. 4 pls. Other Europeans, according to WAE list: Phone 4 pls, C.w. 3 pls.

Participants outside Europe Phone 6 pls, C.w. 12 pls.

The same station may be worked once per band and once per calendar year for the award.

4. The M.O.D. will be issued separately for c.w., phone and mixed. Operation of the award is possible on any single band and this will be endorsed accordingly. At least the following minimum points are required for each class:

Class I. (Gold), 300 points.
Class II. (Silver), 300 points.
Class III. (Bronze), 100 points.

5. Contacts may be made on 160, 80, 40, 30, 15 and 10 metre bands.

6. The M.O.D. is available also to Sw's or Special requirements are issued separately for the Munich stations.

1. Fee: U.S. \$1.00, DM 4, or 10 IRCs.

2. Address for the application: Engelbert Mäuser, DJ8ZU, D8 Munich 13, West Germany, Kaulstrasse 6

Only a list of the QSO details is required. This list must have been checked against the received QSL cards, and certified by two other licensed Amateurs. The QSLs may be called in for inspection by the Award Committee.

QSLs to the Munich stations worked must also have been received in Munich before the issue of the award.

AUSTRALIAN V.H.F./U.H.F. RECORDS

| | |
|------------|--|
| 50/52 MHz. | VK3ALZ to KRIFU, 1/5/68, 84.0 miles |
| 144 MHz. | VK5BC to ZLHFP, 22/12/65, 1857 miles |
| 432 MHz. | VK3ALZ to VK5DNR, 28/5/68, 463 miles |
| 578 MHz. | VK5ZL/5 to VK5QZ/5, 28/12/69, 185 miles |
| 11898 MHz. | VK5KX to VK7WF, 6/2/70, 225 miles |
| 2300 MHz. | VK5KA to VK5ANW, 18/2/80, 9.0 miles |
| 3300 MHz. | VK5ZGT to VK5ZDQ/3, 14/12/63, 83.5 miles |

Australian R.M.E. Record

| | |
|----------|--|
| 144 MHz. | VK5ATN to KEMWA/2, 28/11/66, 10,417 miles. |
|----------|--|

Australian A.T.V. Record

| | |
|----------|---|
| 432 MHz. | VK5AO/T/P to VK5ZEF/T/P, on 18/2/69, 93 miles |
|----------|---|

† N.B.—The records shown for 432 and 1998 MHz. are currently subject to superior claims which are being processed. Results will be published when available.

☆

PROVISIONAL SUNSPOT NUMBERS

FEBRUARY 1970

Dependent on observations at Zurich Observatory and its stations in Locarno and Arosa.

| Day | R | Day | R |
|-----|-----|-----|-----|
| 1 | 154 | 15 | 115 |
| 2 | 120 | 16 | 139 |
| 3 | 79 | 17 | 143 |
| 4 | 68 | 18 | 142 |
| 5 | 77 | 19 | 120 |
| 6 | 109 | 20 | 125 |
| 7 | 107 | 21 | 128 |
| 8 | 97 | 22 | 123 |
| 9 | 123 | 23 | 164 |
| 10 | 123 | 24 | 165 |
| 11 | 178 | 25 | 170 |
| 12 | 153 | 26 | 142 |
| 13 | 145 | 27 | 150 |
| 14 | 154 | 28 | 146 |

Mean equals 129.8.

Predictions of the Smoothed Monthly Sunspot Numbers

| | |
|----------|-----------|
| March 84 | June 90 |
| April 83 | July 88 |
| May 81 | August 87 |

—Swiss Federal Observatory, Zurich.

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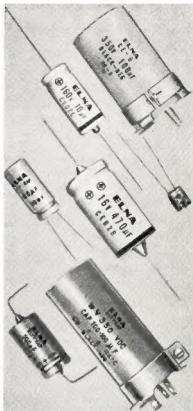
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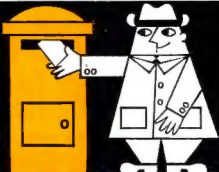
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